

REMARKS

This Amendment/Response is supplemental to the response filed on August 12, 2009.

Specification

The specification and Abstract were objected to by the Examiner in the office action of May 12, 2009. Applicant here attaches a substitute specification and abstract which addresses the Examiner's objections. No new matter is added by the substitute specification.

Applicants note that an attached substitute specification was referred to in the amendment filed on August 12, 2009 on page 2 and in the Remarks on page 8. Applicants, however, inadvertently failed to attach the substitute specification to the August 12, 2009 response. Accordingly, the substitute specification is here attached.

Applicants further note that this filing is not in response to the final office action mailed December 3, 2009. A response to the December 3, 2009 office action will be filed at a later date.

In any case, since the substitute specification is in compliance with a matter of form expressly set forth in a previous office action, entry of the attached substitute specification is fully warranted under the provisions of 37 CFR 1.116(b)(1), and is respectfully requested.

No new matter is added by the attached substitute specification.

Conclusion

In view of the above, it is submitted that the claims of this application are in condition for allowance, and early issuance thereof is solicited. Should any questions remain unresolved, the Examiner is requested to telephone Applicant's attorney.

No fee is incurred by this paper.

Respectfully submitted,

/Robert E. Bushnell/
Robert E. Bushnell,
Registration No.: 27,774

Customer No.: 008-439

2029 "K" Street N.W., Suite 600
Washington, D.C. 20006
(202) 408-9040
Folio: P58024
Date: 12/30/09 I.D.: REB/MK

EGG THAT IS AGITATED WITH EDIBLE COMPOSITION,
METHOD AND DEVICE FOR MANUFACTURING IT

5 **Technical Field**

The present invention relates to a processed raw egg having an edible composition agitated therewith therein, and a method of, and apparatus for, manufacturing the same, in which an edible compositions useful to the human body is—are injected into the inside of a raw egg and agitated inside of the raw egg, and the resultant raw egg can be boiled and/or steamed so as to intake, thereby serving as providing a nourishing meal or a healthy food.

15 **Background Art**Background of the Invention

Generally, a raw egg is in-takeneaten in a raw state or in a boiled state. At this time, due to the fishy smell inherent to the raw egg, mostly generally, people do not eat more than one or two eggs. In case of a boiled egg, the boiled yolk (the yellow of the egg) is not smooth so that people is prone to be reluctant to eat making the egg undesirable for many people to eat.

A method of smoking a chicken egg is disclosed in Korean Patent Laid-open Publication Nos. 2001-0003319, 1999-0073457, 2000-0030104, and 2001-0073241.

The smoked egg can be kept for a long time and in-takeneaten, but it is smoked in such a way that a

composition such as salt is permeatedpermeates into the inside of the egg through micro-pores of the egg-shell. Therefore, the fishy smell of the chicken egg can be alleviated, but not completely removed. In addition, since 5 nutrients necessary for the human body such as vitamin C, which are hardly existspresent in chicken eggs, cannot be permeated adequately into the chicken egg, theThe method of smoking eggs merely adjusts the flavor thereof, or lengthens its effective date.

10 In addition, Korean Patent Laid-open Publication No. 2001-0084617 discloses a method of externallyadding externally additives to the contents of a chicken egg. In this method, the raw chicken egg is dipped in thesalt water and matured-soaked in order for salt to be 15 permeatedpermeate into the egg through micro-pores of the egg-shell. Therefore, it merely applies salt for seasoning, but does not permeates useful nutrients into the egg.

On the other hand, Korean Patent Laid-open Publication No. 2000-0008062 discloses a method of permeating and mixing salt water or spices and condiments 20 into the egg.

In the above method, however, a needle offrom a syringe is used to inject the additives, so that a mass production and thus-commercialization is not easy, along 25 with The method is also not being-hygienic.

Moreover, the albumen and the yolk of the raw egg contains a lot of carbohydrate and is-are highly viscous.

so that the cohesive power between the albumen and the yolk is therefore strong, thereby preventing the injected salt and nutrients from spreading over the whole area of the egg. From the result of experiments, it has been found
5 ~~out~~ that the above-processed egg is not easy to ~~in-take~~ eat.

As a result of experiment according to the above prior art, i.e., when the raw chicken egg is rotated forwards and in a reverse direction in order to mix the albumen and the yolk, it has been found out as follows the
10 the following has been discovered.

In other words, as a result of rotating a raw chicken egg in a forward direction a raw chicken egg at a low speed (60rpm/min), intermediate speed, and high speed (500rpm/min), it has been found ~~out~~ discovered that the
15 centrifugal force is applied identically to the egg-shell, and the contents of the egg, so that the albumen and the yolk are not mixed.

In addition, it seems that, when the raw chicken egg is rotated in a reverse direction while after rotating in a
20 forward direction, the contents of the egg will be mixed. However, a sliding action occurs only between the egg-shell and the contents thereof, but the yolk inside the albumen is not broken, so that they are not mixed. That is, at the moment when the egg is rotated in a ~~revere~~ the reverse direction while rotating a positive direction, the solid component, the egg-shell is rotated in a—the reverse direction instantaneously, but the liquid component, the
25

contents of the egg, responds more slowly.

In consequence, the prior art injects salt or seasonings using a syringe into the egg, but the contents thereof is not mixed, thereby not being and is therefore not
5 practical.

In another mixing method, dissimilar to the conventional technique where the raw egg is rotated in a circumferential direction—thereof, the raw egg is reciprocated with spun at a fast speed in a—the longitudinal
10 direction of the long axis of the egg, thereby mixing the contents of the egg.r This is due to the air pocket (air layer) inside the raw egg.

In the above technique, when the raw egg is reciprocally moved spun until the contents of the egg are
15 thoroughly mixed, the raw egg is rotten or becomes stale to the extent that it cannot be eaten.

Furthermore, although even when the raw egg does not become too stale enough to eat, when the egg-shell is removed from a boiled egg by people who expects someone
20 expecting that the white of the egg will be exposed, it is likely to spoil his or her appetite. That is, since the mixed albumen and yolk appears to be stained, it has been found from the experiments that the outer appearance lowers the appetitemakes the egg less appetizing to many people,
25 and reduces their desire to eat the egg, which leads to a feeling of reluctance against eating.

Disclosure of InventionSummary of the Invention

The present invention has been made in order to solve the above problems occurring in the art, and it is an object of the invention to provide a processed raw egg, and 5 a method of, and apparatus for, manufacturing the same, in which various edible compositions are added and mixed to—a in the raw egg including a chicken egg without ~~not~~ being making it stale. This thereby eliminating eliminates the fishy smell inherent in raw eggs and enabling—enables 10 it to be served as a healthy food.

Another object of the invention is to provide a processed raw egg, and a method of, and apparatus for, manufacturing the same, in which, when the egg-shell is removed from a well-done egg having an edible composition 15 mixed therewith, the albumen is exposed in the same appearance as in ~~the—a~~ conventional well-done egg. This thereby eliminating eliminates any a feeling of reluctance on the part of a consumer in ~~taking~~ eating the egg.

A further object of the invention is to provide a raw 20 egg having various colors, including a natural color of an edible composition added thereto, or a color of edible pigments.

A further object of the invention is to provide a raw egg having various aromas, including an aroma of an edible 25 composition added thereto, or an aroma of various edible spices.

In order to accomplish the above object, according to

one aspect of the invention, there is provided a method of manufacturing a processed raw egg having an edible composition agitated therewith. The method comprises: a) a cleaning and sterilizing step for cleaning ~~an-a~~ raw egg (E) 5 with a-cleaning water and sterilizing ~~at~~the egg (E); b) an egg-shell drilling step for forming an injection hole (Ef) in the upper portion of the egg-shell (Ea) of the raw egg (E), wherein the raw egg (E) is fixedly erected and a certain pressure is exerted on the upper portion of the 10 long axis of the raw egg by means of a drilling and injection tube (42) such that the injection hole is formed; c) an edible composition injection step for injecting a predetermined amount of edible composition (P) by penetrating the drilling and injection tube (42) inside the 15 raw egg (E) through the injection hole (Ef) of the raw egg (E); and d) a raw egg agitation step for agitating the edible composition (P) and the viscous albumen (Eb) and yolk (Ed) using an agitating means inserted through the injection hole (Ef) of the raw egg (E).

20 According to another aspect of the invention, there is provided a method of manufacturing a processed raw egg having an edible composition agitated therewith. The method comprises: a) a cleaning and sterilizing process (a first step) for cleaning ~~an-a~~ raw egg with a-cleaning water and 25 sterilizing it with ozone; b) a solidified albumin skin layer forming process (a second step) for forming a solidified albumen skin layer having a thickness of 2-3mm,

wherein the albumen inwards of the egg-shell is heated and solidified for 5-8 minutes at 60-65°C; c) an egg- shell drilling process (a third step) for forming an injection hole in the egg-shell, wherein the raw egg is fixedly
5 erected and a pressure of 3-5kg/cm² is exerted by means of a drilling and injection tube; d) an edible composition injection process (a fourth step) for injecting an edible composition within 10volume% of the raw egg by penetrating the drilling and injection tube through the injection hole
10 of the raw egg; e) a raw egg agitation process (a fifth step) for agitating the edible composition and the viscous albumen and yolk in such a manner that a support and axle rod having a rotating member provided in the outer peripheral thereof is inserted through the injection hole
15 and the rotating member is spread and rotated; and f) a well-done-process (a sixth step) for producing a well- done egg by providing a heat to the raw egg.

In addition, before the fourth step of injecting the edible composition, or instead of the fourth step, at least
20 part of the yolk is removed by suction, and grains including rice, barley, brown rice, and glutinous rice ~~is~~ are added and agitated. A chicken egg includes 8-11 weight% of egg-shell, 27-32 weight% of yolk, and 56-61 weight% albumen. In the case where the yolk is completely removed,
25 it can provide a healthy food to people who do not like the yolk, or to whom the yolk, having which has a lot of cholesterol, is harmful. Also, since about 30% of the

chicken egg can be replaced by grains, nutrients of grains including carbohydrate is added to the raw egg, thereby providing a more balanced, nourishing, meal.

Alternatively, at least part of the yolk remains, but 5 part of or the entire of the yolk and/or the albumen can be removed. Instead, fruits can be injected and agitated in a powder form or in a liquid extract form, along with Calcium or an edible material containing Calcium (for example, diary product such as milk, bean, green vegetable, seaweed, 10 fish bone), so that a raw egg pudding can be made by means of the inter-mixing of the fruit constituent, Calcium and the yolk.

According to another aspect of the invention, there 15 is provided an apparatus for manufacturing a processed raw egg having an edible composition agitated therewith. The apparatus comprises: a) a raw egg holding means (30) including a resting groove (31) for ~~an-a~~ raw egg to be rested thereon and a pressurizer (35) for pressurizing one side of the raw egg (E); b) a drilling and injection tube 20 (42) for forming an injection hole (Ef) in the upper end portion of the raw egg (E); c) a drilling and injection means (40) for injecting an edible composition (P) into the interior of the raw egg, the drilling and injection means including a quantified discharging pump (46) and the 25 drilling and injection tube (42); and d) an agitating means (60) for agitating the internal material of the raw egg, the agitating means being injected in the form of a rod and

afterwards spread, and moving upwards and downwards and/or rotating.

The apparatus of the invention may further comprise a suction pump and a suction tube, so that part of or the 5 entire entirety of the contents of the raw egg including the albumen and the yolk is removed and instead grains or fruits can be added as much as the removed material. In addition, instead of the suction pump, the quantified pump can be reverse-operated to thereby remove part of, or the 10 entire entirety of, the yolk.

According to another aspect of the invention, there is provided a processed raw egg having an edible composition agitated therewith. In the processed raw egg, a certain desired amount of edible composition is injected 15 through an injection hole formed in the upper portion of the long axis of a raw egg, and the injected edible composition and the contents of the raw egg are agitated by an agitating means. The agitating means is inserted in the form of a rod, spread in a desired form, and moved inside 20 the raw egg.

Brief Description of the Drawings

Further objects and advantages of the invention can be more fully understood from the following detailed 25 description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a flow chart explaining a method of

manufacturing ~~an~~—a raw egg having an edible composition mixed inside thereof according to the invention; and

FIG. 2 illustrates schematically the first step of cleaning and sterilizing a raw egg in the method of the
5 invention;

FIG. 3 illustrates schematically the second step of solidifying the albumen surface of a raw egg in the method of the invention;

FIG. 4 shows a cross-section of a raw egg processed
10 by the second step of the invention;

FIG. 5 is a schematic view of an apparatus of the invention for carrying out the third and fourth steps of the method of the invention;

FIG. 6 is a partially enlarged view of the egg-shell
15 drilling and injection means according to the invention;

FIGS. 7 to 9 show the operation of the egg-shell drilling and injection means, which carries out the third and fourth steps of the invention;

FIG. 10 is a schematic view of an apparatus of the
20 invention for carrying out the fifth step of the method of the invention;

FIG. 11 shows a cross-section taken along the line U-U' in FIG. 10;

FIG. 12 is an enlarged view of the agitating means
25 according to the invention;

FIG. 13 is an enlarged exploded view of a core portion of the agitating means of the invention;

FIG. 14 is an enlarged view of the portion V in FIG. 12;

FIG. 15 shows a cross-section taken along the line W-W' in FIG. 12;

5 FIG. 16 shows an enlarged cross-section taken along the line X-X' in FIG. 12;

FIG. 17 shows an enlarged cross-section taken along the line Y-Y' in FIG. 12;

10 FIG. 18 shows an enlarged cross-section taken along the line Z-Z' in FIG. 12; and

FIGS. 19 to 21 show the operation of the agitating means, which carries out the fifth step of the invention; and

15 FIG. 22 is a cross-section of a raw egg processed according to the invention.

Best Mode for Carrying Out Detailed Description of the Invention

The preferred embodiments of the present invention 20 will be hereafter described in detail with reference to the accompanying drawings.

In the-this description, the term "raw egg" means an egg-cell that a female animal lays in vitro. The raw egg includes any egg-cell as long as it has an egg-shell, and a 25 yolk and an albumen contained and divided inside the egg-shell. Preferably, the raw egg suitable for the invention includes a bird egg such as a chicken egg, a quail egg, a

duck egg, and an ostrich egg, an unfertilized or fertilized reptile egg such as a turtle egg and an alligator egg.

FIG. 1 is a flow chart showing the procedure of manufacturing a raw egg having an edible composition mixed 5 inside thereof. In the first step in the manufacturing method of the invention, an egg having a high freshness is selected, cleaned, and sterilized. The first step is referred to as a "cleaning and sterilizing step."

FIG. 2 illustrates, schematically the first step of 10 cleaning and sterilizing a raw egg in the method of the invention. Referring to FIG. 2, a plurality of raw eggs (E) ~~is—~~^{are} arranged on a screen (11) of a cleaning and sterilizing chamber (10) and cleaned by a—salt water forcefully sprayed through a nozzle (12).

15 The cleaning water, i.e., the salt water is harmless to the human body and has a characteristic of suppressing the multiplication of the Escherichia coli.

The cleaning water passes through the screen (11) on which the raw eggs (E) ~~is—~~^{are} placed, and flows downwards 20 to thereby clean other raw eggs placed on the lower screens (11).

On completion of the cleaning process, a cold air blower (13) and an ozone generator (14) are operated in order to blow a—cold air and an—ozonized air inside the 25 cleaning and sterilizing chamber (10).

The cold air blown to the raw egg (E) has a temperature of 0~1°C such that the cleaning water remaining

on the surface of the raw egg (E) can be dried.

In the case where the drying air is heated-up, for example, the raw egg (E) may be made rotten or damaged while carrying out the first step. Therefore, a-cool, cold 5 air is used in order to dry the cleaning water remaining on the surface of the raw egg (E).

In addition, an-ozonized air is blown into the cleaning and sterilizing chamber (10) during the process for drying the raw egg (E), thereby simultaneously carrying 10 out a sterilizing-sterilization process. The ozonized air is commonly used for disinfecting various bacteria, and thus further detail thereon will not be described herein.

The quantity of ozonized air, which is blown into the cleaning and sterilizing chamber (10), is very small, on 15 the order of 4 mg/l per one hundred of raw eggs, so that it is harmless to the human body. The results of an experiment, where 4 mg/l of ozonized air per 100 eggs is contacted with the raw eggs for 15 minutes, it-has-been found-show that Escherichia coli is disinfected from 3,000 20 into less than 10. When contacted for 20 minutes, Escherichia coli is found-outshown to have been disinfected into less than 2.

Therefore, the quantity of ozonized air required to be blown into the cleaning and sterilizing chamber (10) is 25 calculated in proportion to the number of raw eggs (E) inside the chamber and blown thereinto-into for 20 minutes. Then, Escherichia coli harmful to the human body is

sterilized, along with *Salmonella*, *Staphylococcus*, *enteritis vibrio*, and the like.

The above cleaning and sterilizing step of raw eggs (E) is for the purpose of hygienic treatment for the whole process of the invention. Also, the cleaning and sterilizing step serves to prevent bacteria from penetrating the inside of the raw egg (E) during the subsequent third step of drilling the egg-shell.

The second step is a process for solidifying the albumen surface of a raw egg.

Referring to FIG. 3, in the albumen surface solidifying step, a plurality of raw eggs (E) is placed on a screen (21) inside the a humidifying and heating chamber (20) and heated for 5-8 minutes by blowing ~~an~~-air heated to 60-65°C using a heater (22). At this time, the raw egg (E) is prevented from drying by flowing moisture into the humidifying and heating chamber (20) using a humidifier (23), or by installing the humidifier (23) inside the humidifying and heating chamber (20).

While the second step is carried out, the egg shell (Ea) of the raw egg (E) starts to be heated and then the albumen (Eb) is progressively boiled inwards of the egg-shell (Ea), as shown in FIG. 4, which is a cross-section of a raw egg processed by the second step.

When the second step is finished, the raw egg (E) is processed such that the albumen (Eb) is boiled and cooked ~~by~~to a thickness of 2-3mm inwards of the egg-shell (Ea) to

thereby form a solidified albumen skin layer (Ec) (the dotted area in FIG. 4). The albumen (Eb) and the yolk (Ed) inside the solidified albumen skin layer (Ec) remain in a semi-solid state.

5 By reference, in order for a raw egg to be well-done, it must be boiled at 80-85°C or higher for more than 12 minutes. In the second step of the invention, the raw egg is heated at 60-65°C for 5-8 minutes such that the surface area of the albumen (Eb) in the proximity of the egg-shell
10 (Ea) is done to thereby form the solidified albumen skin layer (Ec).

When the albumen (Eb) of semi-liquid state and the yolk (Ed) are agitated, the solidified albumen skin layer (Ec) is not agitated and remains in the solidified state.
15 Therefore, when the raw egg is well done (fully boiled) and the egg-shell (Ea) (crust) is removed, the original color of the albumen (Eb) (white color) is exhibited.

The third step is an egg-shell drilling process, the fourth step is an edible composition injection process, and
20 the fifth step is a raw egg agitating process, as illustrated in FIGS. 5 to 21. The second to fifth steps are continuously and automatically carried out.

Referring to FIGS. 5 and 6, the third and fourth steps, the egg-shell drilling process and the edible composition injection process are described hereafter.
25

Referring to FIG. 5, the apparatus of the invention is provided with a raw-egg holding means (30) for fixing

the raw egg (E).

The raw egg holding means (30) is provided with a fixed member (32) having a resting groove (31), to which the raw egg can be inserted and rested. The resting groove (31) has a tough and buffering protection member (33) attached to the inner face thereof.

In addition, a pressurizing cylinder (34) is mounted on one side face thereof. The pressurizing cylinder (34) is operated such that a pressurizer (35) presses one side face 10 of the raw egg (E) so as not to be moved.

Therefore, the pressurizing cylinder (34) is operated in such a manner that the pressurizer (35) moves backwards in order for a raw egg (E) to be rested on the resting groove (31), and thereafter moves forwards and pressurizes 15 the raw egg (E).

At this time, the protection member (33) serves as a buffer so that the raw egg is not broken, in spite of a slightly slight differences in the size of the eggs.

The raw egg is held in the raw egg holding means (30) 20 in such a way that the elongated portion of the raw egg is oriented upwards.

The raw egg (E) held and fixed in the raw egg holding means (30) is drilled in its egg shell (Ea) and injected with an edible composition (P) by means of a drilling and 25 injection means (40).

The drilling and injection means (40) is provided with a drilling and injection tube (42), which is descended

and ascended vertically by the operation of a pressurizing cylinder (41) fixed to a main plate (50). The drilling and injection tube (42) is provided with a pointed needle (43) at the end thereof, and has a diameter of 2mm.

5 At one side of the pressurizing cylinder (41), a composition tank (44) is fixed to the main plate (50). In the outlet (45) of the composition tank (44) is installed a quantified discharging pump (46) for pressure-transferring the edible composition (P).

10 The quantified discharging pump (46) is constructed such that the edible composition (P) discharged therefrom is pressure-transferred into the drilling and injection tube (42) through a pressure-transferring hose (47) via an intermediate station (48), which is installed above the drilling and injection tube (48) (refer to FIG. 6).

15 The operation of the egg-shell drilling and injection means (40) will be explained below. Details on the edible composition (P) will be described hereinafter.

20 At the initial state of the egg-shell drilling and injection means (40), the drilling and injection tube (42) is placed above the raw egg (E), as illustrated in FIG. 7.

At this state, the pressurizing cylinder (41) is operated to descend the drilling and injection tube (42) slowly to reach the egg-shell (Ea), as illustrated in FIG.

25 8.

Since the pressurizing cylinder (41) must be operated slowly, it is preferred to be a hydraulic cylinder, and it

has been found out—that a pressure of 3-5kg/cm² should be exerted to the egg-shell (Ea) in order to form a hole therein.

In addition, the raw egg is erected in a longitudinal direction, and thus an injection hole (Ef) can be formed without breaking the egg, due to the resistant force of the egg-shell against the pressurizing force.

The area where the injection hole (Ef) is formed is slightly depressed, but can be disregarded, and thus does not affect significantly the commercialization of the egg.

Therefore, the drilling and injection tube (42) is inserted into the central portion of the raw egg (E) and then the third step, i.e., the egg-shell drilling process is completed, as shown in FIG. 9.

Next, the fourth step of edible composition injection process is carried out. In the edible composition injection process, at the state of FIG. 9, the quantified discharging pump (46) is operated to inject a quantified amount of edible composition (P) into the inside of the yolk (Ed) and the albumen (Eb) of semi-liquid state through the drilling and injection tube (42).

On the other hand, the edible composition (P) is formed of a liquid composition with a small amount of powder mixed therewith, and the amount of the edible composition (P) is less than 10% volume% of the entire volume of the raw egg.

When the injection of the edible composition (P) is

finished, the pressurizing cylinder (41) is reverse-operated to lift the drilling and injection tube (42), which is released from the raw egg (E) and returned to the initial state as in FIG. 9. These operations are 5 continuously and automatically performed by means of a controller (not shown).

Since the ~~solidified~~ solidified albumen skin⁺ layer (Ec) has a-flexibility, it is contracted when the drilling and injection tube (42) is escaped~~-removed~~ from the raw egg 10 (E), so that the-it can be shut down from an external air and also the albumen of semi-liquid is not leaked to the outside thereof.

On the other hand, the edible composition (P) used in the invention is formed of a liquid composition with a 15 little powder mixed therewith. Here, the constituents of the edible composition are described below, and the effect therefor will be hereinafter explained.

That is, the edible composition (P) is comprised of edible and inter-mixable constituents selected from all the 20 natural and processed materials. The constituents do not cause any harmful chemical reactions with one another, and include brown rice, bean paste, garlic, ~~anionion~~, kelp, powdered pyogo mushroom, sesame oil, perilla oil, fine leaf extract, dropwort extract, propolis, grape seed oil, 25 vinegar, basil, peppermint, chervil, lavender, salt, sugar, grains, fruits, nuts, fishes, shells, vitamin C, spices, pigment, and the like. Among the above constituents, the

salt and sugar may be in a liquid or powder form. The salt or sugar is a basic constituent, which is added to all kinds of edible compositions (P) in-of the invention.

Several examples for the constituents and contents of 5 the edible composition (P) will be illustrated below. The contents thereof are based on the volume of the raw egg (E).

Here, a chicken egg is used as the raw egg.

{Example-1}EXAMPLE 1

10 An edible composition (P) comprises brown rice 2 volume%, bean paste 1 volume%, garlic 1 volume%, onion 1 volume%, kelp 1 volume%, powdered pyogo bushroom 1 volume%, sesame oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-2}EXAMPLE 2

15 An edible composition (P) comprises pine leaf extract 2 volume%, perilla oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-3}EXAMPLE 3

20 An edible composition (P) comprises dropwort extract 3 volume%, perilla oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-4}EXAMPLE 4

25 An edible composition (P) comprises propolis 1 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-5}EXAMPLE 5

An edible composition (P) comprises vinegar 2

volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-6}EXAMPLE 6

An edible composition (P) comprises basil 2 volume%,
5 grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

{Example-7}EXAPMLE 7

An edible composition (P) comprises peppermint 1 volume%, grape seed oil 2 volume%, salt 1 volume%, and
10 sugar 1 volume%.

{Example-8}EXAMPLE 8

An edible composition (P) comprises chervil 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

15 {Example-9}EXAMPLE 9

An edible composition (P) comprises lavender 2% volume, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%.

The fifth step is carried out in the raw egg (E), to
20 which an edible composition (P) is injected. The fifth step is performed through an agitating means (60) and will be described below.

Referring to FIGS. 10 and 11, the main plate (50) is constructed so as to move along a guide rail (52) fixed on
25 the support frame (51). The movement of the main plate (50) is carried out by a reciprocating cylinder (53) installed in one side thereof.

Therefore, after the raw egg (E) is processed through the egg-shell drilling and injection means (40), the reciprocating cylinder (53) is operated to move the main plate (50) in order for the agitating means (60) to be moved and held above the raw egg (E).

This moving and holding operation is carried out in such way that a controller (not shown) controls the operation of the reciprocating cylinder (53) when a dog (50a) provided in the main plate (50) approaches a first and second sensor (54) and (55).

That is, when the operation of the egg-shell drilling and injection means (40) is finished in the third and fourth steps, according to the instructions of the controller, the reciprocating cylinder (53) is operated to move the main plate (50) such that the dog (50a) approaches the second sensor (55).

Therefore, the second sensor (55) sends a signal to the controller, and the controller stops the movement of the reciprocating cylinder (53) according to the signal.

In addition, when the operation of the agitating means (60) is finished in the fifth step, the controller controls the reciprocating cylinder (53) such that the main plate (50) returns to its original position. At this time, when the dog (50a) approaches the first sensor (54), a signal is applied to the controller to stop the operation of the reciprocating cylinder (53).

The operation of the apparatus of the invention

required for the manufacturing process of the invention is configured so as to be controlled by a controller. The control technique is well known, and thus details on the controller will not be described here.

5 Referring to FIGS. 12 to 18, the agitating means (60) for carrying out the fifth step of the invention will be explained below.

Referring to FIGS. 12 to 14, in the agitating means (60), an ascending and descending cylinder (61) is
10 installed in the main plate (50), and a driving device (63) including a support member (62) descends or ascends by means of the ascending and descending cylinder (61).

In the driving device (63), a long support axle rod (64) is fixed to the center of the support member (62), and
15 a free-rotating member (67) having a gear (65) and a rotating groove (66) is rotatably installed in the upper portion thereof.

The gear (65) of the free-rotating member (67) is engaged with a driver gear (69), which is rotated by a reciprocal motor (68), as shown in FIG. 15. Therefore, the free-rotating member (67) is constructed so as to rotate in forward and reverse directions by a—rotating power transferred from the reciprocal motor (68).

In addition, an ascending and descending member (70) is inserted into the rotating groove (66) of the free-rotating member (67), as shown in FIG. 16. The ascending and descending member (70) is constructed such that it can

move upwards and downwards by the operation of a moving cylinder (71) fixedly installed in the support member (62).

Therefore, as the ascending and descending member (70) moves upwards or downwards, the free-rotating member (67) moves upwards or downwards along the support axle rod (64).

In addition, the gear (65) is elongated vertically and thus the free-rotating member (67) can move upwards, and downwards at the engaged state with the driver gear (69). Also, when the downward movement of the free-rotating member (67) is completed and held in place, the free-rotating member (67) can be rotated in a forward or reverse direction by the driver gear (69), which is rotated by the rotation of the reciprocal motor (68).

On the other hand, a plurality of rotating members (72) (for example, four rotating members) is/are fixed to the lower end portion of the free-rotating member (67) in such a manner that the rotating members (72) is/are rotated by the rotation of the free-rotating member (67) (refer to FIG. 17). The rotating members (72) may be fixed by using the-argon welding, the-spot welding, or the like.

Furthermore, the-a rotating member (72) has a thin thickness on the order of 0.6mm and is formed of a-piano wire or stainless steel having a-good resilience. As shown in FIG. 13, the rotating member (72) is provided with a bending groove (72a) formed in the inner side of the intermediate portion thereof so as to be easily bent.

The rotating member (72) is closely contacted with the outer circumferential surface of the support axle rod (64), and a ring (73) is inserted at the middle of thereof and fixed thereto by a-welding and/or the like.

5 Therefore, the ring (73) rotates as the rotating member (72) rotates on the circumferential surface of the support axle rod (64) (refer to FIG. 18.).

A free-rotating ring (74) is inserted into the lower end portion of the rotating member (72) and fixed thereto by a-welding or the like.

10 As shown in FIG. 14, a rotating projection (75) is formed in the inner circumferential surface. The rotating projection (75) is rotatably inserted into a guide groove (76) of the support axle rod (64). The entire diameter of 15 all of the support axle rod (64), the rotating groove (71) and the free-rotating ring (74) is such that they can be inserted through the injection hole (Ef) formed in the upper end portion of the raw egg (E).

Therefore, the free-rotating ring (74) is rotated by 20 the rotation of the rotating member (72), but does not move upwards and downwards along with the support axle rod (64) since the rotating projection (75) is rotatably inserted into the guide groove (76).

Referring to FIG. 12, the operation of the agitating means (60) will be described below.

At the initial state of the agitating means (60), the driving device (63) is placed above as shown in-by an

imaginary line.

In this state, the ascending and descending cylinder (61) is operated such that the driving device (63) is moved downwardly as shown in-by a solid line.

5 Next, the moving cylinder (71) is operated such that the free-rotating member (67) is moved downwardly as shown in-by an imaginary line. At this time, the rotating member 72 is descended since the upper end portion thereof is fixed to the free-rotating member (67).

10 However, since the rotating member (72) rotates only at its lower end portion and the free-rotating ring (74) connected so as not to move up-and down is fixed to the rotating member (72), the lower end portion of the rotating member (72) does not descend and only its upper end portion 15 descends. Therefore, that portion of rotating member (72) between the ring (73) and the free-rotating ring (74) is bent outwardly as depicted in-by an imaginary line.

At this state, when the reciprocal motor (68) is operated, its driving power rotates the free-rotating 20 member (67) via the driver gear (69), and thus the rotating member (72) rotates about the support axle rod (64).

The returning operation to its original state is carried out in a reverse order of the above-described operation.

25 FIGS. 19 to 21 show the operation of the agitation means (60) to perform the fifth step of agitating a raw egg. FIG. 19 shows the initial state thereof, and FIG. 20

shows the state where the support axle rod (64) and the rotating member (72) are inserted into the injection hole (Ef) of the raw egg (E).

Therefore, at the above state, the rotating member (72) is spread sideways to form an impeller-like shape.

In this state, the reciprocal motor (68) is operated to rotate the rotating member (72) such that the semi-liquid albumen (Eb), the yolk (Ed), and the edible composition (P) are agitated and mixed. If a solidified albumen skin layer (Ec) is formed, it remains unmixed, not being agitated by the rotating member (72).

In the above-described embodiment, an agitating means, which is spread in an impeller form and rotated, is illustrated, but the present invention is not limited thereto. For example, an agitating means may be injected in a rod form and spread in various forms, and moves upwards and downwards or rotates in order to agitate the contents inside the raw egg.

On the other hand, when the raw egg is agitated and well-done, the salt and sugar contained in the edible composition (P) play an important role. That is, the major constituent of the albumen (Eb) and the yolk (Ed) is an alkaline protein. Here, if the salt, which is an inorganic salt, is contained, it becomes an electrolyte, which adsorbs an ion having an opposite electric charge, so that an-electrical neutralization is achieved, thereby enabling an-easy solidification when carrying out a-well-done

cooking. Also, in a state of a raw egg, when the conalbumin among the proteins of the albumen is bonded with a metallic ion such as Na of the salt NaCl, the internal bonding of the protein is cut, thereby increasing its activity.

5 That is, the salt serves to decrease the viscosity during agitating the mucus albumen (Eb) and the yolk (Ed), so that the edible composition (P) is mixed more thoroughly.

10 In addition, even with the same raw egg, the albumen (Eb) and the yolk (Ed) exhibit a different solidifying temperature and solidified state when well-done. That is, when the raw egg is heated up slowly from a low temperature, it becomes soft. Heating fast at a higher temperature is likely to generate porosity. Furthermore, 15 the solidification capacity of a raw egg (E) is affected by other materials. When sugar is contained in the raw egg, it absorbs sucrose contained in the protein of raw egg so that the solidification temperature of the raw egg (E) is increased. That is, the sugar slows down the heat 20 transformation of protein and thus impedes its solidification, thereby resulting in a soft well-done egg.

Resultantly As a result, the salt functions to lower the viscosity of the mucus albumen (Eb) and the yolk (Ed) so that they can be smoothly mixed with the edible 25 composition (P). The sugar serves to enable the well-done egg to be soft and provide flavor.

As described previously, salt and sugar to be added

to the edible composition (P) may be added in a liquid form or in a powder form. In addition, the above-described embodiment does not exclude other additives, which serves to perform the same as, or similar role to, the salt and
5 the sugar.

On completion of the fifth step (agitating process), of the invention, as shown in FIG. 22, the sixth step (well-done process) is carried out to solidify the mucus contents (Eg), which is inter-mixed excepting the
10 solidified albumen skin layer (Ec). This process may be performed by boiling the raw egg, smoking the raw egg, or steaming the raw egg to thereby make a well-done egg. These processes are well known, and thus details thereon will not be described here.

15 Alternatively, other than the heating and solidifying of raw egg, Pidan process (Pidan: a processed blackish duck egg used for Chinese cooking), which is known from Taiwan or Southwestern China, or its applications can be used for chemically solidifying a raw egg using the solidifying
20 property of alkaline. Pidan is made using a duck egg, but many examples using a chicken egg are known. Accordingly, the chemical solidification method can be applied to all kinds of raw eggs. In case of Pidan, a paste containing salt, lime or the like is coasted-coated on the egg-shell
25 such that the alkaline constituent and salt can be permeated through micro pores of the egg-shell. It is based on the principle that, since protein is charged negatively

usually under the circumstance of above PH 7, it is solidified when a material having an opposite electrical charge to the protein is applied thereto.

According to the invention, when the egg-shell (Ea) 5 is peeled off from the well-done egg manufactured as described above, the solidified albumen skin layer (Ec) having a white color is exposed, and thus provides the same feeling as in eating a generally well-done egg, thereby enabling one to eat it without ~~reluctant-feeling~~reluctance.

On the other hand, according to another embodiment of 10 the invention, the second step may be omitted, and therefore, a solidified albumen skin layer is not formed, instead the albumen and the yolk are mixed and agitated. In this case, when the egg-shell is removed from a well-done 15 egg, the color of the edible composition or a color of any edible pigment ~~is appeared~~appears, and thus can draw attract the user's ~~sone's~~ curiosity and interests.

Furthermore, according to another embodiment of the 20 invention, the second step and the sixth step (solidification process) may be omitted, and thus a raw egg with an edible composition mixed and agitated thereinside can be provided.

On the other hand, the above-described manufacturing 25 apparatus may be provided with an additional suction pump and/or suction tube for suctioning the yolk. Before the edible composition injection process, at least, of the raw egg contents including the albumen and the yolk is removed

and instead the same amount of grains containing a carbohydrate such as rice, barley, glutinous rice, brown rice, or the like can be injected and agitated. Instead of providing an additional suction pump, the quantified discharging pump is reverse-operated to remove part of or the ~~entire~~-entirety of the raw egg contents. The grain may be injected together with an edible composition, or the grain alone may be injected.

Alternatively, part of the raw egg contents is removed, but part of or the ~~entire~~-entirety of the yolk remains. Then, fruit constituent can be injected and agitated in a powder form or in a liquid extract form, along with Calcium or an edible material containing Calcium (for example, diary product such as milk, bean, green vegetable, seaweed, fish bone). In this case, a raw egg pudding can be made by means of the inter-mixing of the fruit constituent, Calcium and the yolk.

As described above, each of the edible compositions is produced by adding at least one edible additive, each of which has ~~a-~~certain nutrients and efficacy. The efficacy of the edible composition examples illustrated in the embodiments of the invention will be described below.

The first example of the edible composition P, which comprises brown rice 2_—volume%, bean paste 1_—volume%, garlic 1_—volume%, onion 1_—volume%, kelp 1_—volume%, powdered pyogo mushroom 1_—volume%, sesame oil 1_—volume%, salt 1 volume%, and sugar 1_—volume%, can be mixed and agitated.

Among the above constituents, the brown rice has an efficacy, including facilitation of metabolism such as fatigue relief and fatness alleviation, enhancement of brain cell metabolism, blood pressure depressant, kidney activation, liver function enhancement, fatness prevention, energy metabolism acceleration. Also, it has an efficacy in menopausal disorder, feeling of helplessness caused by autonomies ataxia imbalance, headache, insomnia, feeling of fatigue, shoulder pain, dizziness, or the like.

10 In addition, it is well known that the bean paste has an efficacy of neutralizing toxins from meats, vegetables, mushrooms, insect, and the like, enhancing appetite, and facilitating digestion, and has an excellent anti-cancer effect. It also has an efficacy in headache alleviation, 15 protection of high-blood pressure, and facilitation of liver function.

The garlic has an efficacy in lowering blood pressure, heart disease, sclerosis of the arteries, facilitation of digestion, constipation, diarrhea, 20 prevention of flu, diabetes, nephritis, fatigue relief, enhancement of stamina.

The onion has an efficacy in ~~dropping-reducing~~ blood pressure, facilitation of digestion, stomach ulcer, and diabetes, and the kelp has an efficacy in constipation, 25 skin aesthetics, diet, and an efficacy of impeding or controlling absorption of fat, cholesterol, excessive salt, heavy metals and harmful substances.

The pyogo mushroom is a low calorie constituent and abundant in various minerals and vitamins. It has an effect of preventing obesity, diabetes, heart disease, liver disease, or the like by adjusting the function of stomach and small intestine due to a constituent called hemi-cellulose. Also, it has an efficacy in anti-cancer, anti-virus, prevention of anemia and sclerosis of the arteries, and ~~alleviating~~ alleviating high blood pressure and cholesterol.

10 The sesame oil has an efficacy in lowering blood pressure, sclerosis of the arteries, constipation, enhancement of robustness and stamina, and the like. The perilla oil prevents sclerosis of the arteries, lowers the level of cholesterol, has an excellent effect of preventing 15 carcinoma of large intestine, and has an efficacy of disinfecting the bite of poisonous insects.

 The salt adjusts flavor and facilitates agitation, and the sugar serves to smoothly solidify the protein of raw egg during its solidification.

20 In the case of the second example of edible composition, which comprises pine leaf extract 2 volume%, perilla oil 1 volume%, salt 1 volume%, and sugar 1 volume%, a well-done egg having a good aroma can be obtained. The pine leaf extract has an effect and efficacy in liver 25 disease, intestine disease, nervous disease, skin protection, prevention of paralysis, strengthening of stomach, blood nourishment, prevention of aging-related

disease such as sclerosis of the arteries, high blood pressure, and diabetes. Details on the perilla oil, salt, and sugar are described above and thus will not be repeated.

5 Therefore, the well-done egg agitated with the edible composition of the second example is suitable as a healthy food for people who like pine aroma.

The third example of edible composition comprises dropwort extract 3 volume%, perilla oil 1 volume%, salt 1
10 volume%, and sugar 1 volume%. Its main constituent, the dropwort has a good effect and efficacy in stopping bleeding (hemostatic effect), high blood pressure, jaundice, influenza, alleviation of fever, tranquility, alcoholic poisoning, pneumonia, menstrual irregularity,
15 sunstroke, robustness of stamina, acute and chronic inflammation of liver, cirrhosis of the liver, nourishment of blood, and constipation. It is suitable as a healthy food for people who need this efficacy.

In case of the fourth example of edible composition,
20 which comprises propolis 1 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%, the bioflavonoid contained in the propolis activates generation of interferon by stimulating leucocyte and limp sites, thereby providing an amazing resistance against diseases.
25 The grape seed oil has a good efficacy in anti-oxidation, enhancement of skin smoothness and resilience, strengthening of capillary vessel, artery and vein,

suppression of inflammation enzyme, enhancement of joint flexibility, and restoration of deteriorated memory, thereby providing a good healthy food for people who have a week resistance against diseases.

5 In the fifth example of edible composition, which comprises vinegar 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%, the vinegar suppresses synthesis of fat and decomposes fat to thereby prevent accumulation of fat, activate metabolism in the interior of
10 the body, and provide a good efficacy in constipation. The grape seed oil has the efficacy as described above. Therefore, this example of edible composition is suitable for a city-dweller's healthy food.

15 The sixth example of edible composition (P) comprises basil 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%. The basil has an efficacy in rheumatism, hypersensitivity, headache, stomatitis, and robustness. Therefore, along with the efficacy of the grape seed oil, it can be a good healthy food for elderly and
20 weak people.

25 In the case of the edible composition of the seventh example, which comprises peppermint 1 volume%, grape seed oil 2 volume%, salt 1 volume%, and sugar 1 volume%, the peppermint has an efficacy in increasing blood pressure, strengthening of stomach, prevention of flu, headache, toothache, neuralgia, and alleviation of fever. Therefore, along with the efficacy of the grape seed oil, it provides

a good healthy food.

The eighth example of edible composition comprises chervil 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%. The chervil contains lots of 5 vitamin C, carotin, magnesium and has an efficacy in lifeblood, urination, facilitation of digestion, rheumatism, improvement of skin. Therefore, it provides a diet healthy food for women.

The ninth example of edible composition comprises 10 lavender 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%. The lavender has a good effect for rheumatism, arthritis, and has an efficacy in bronchitis, allergic rhinitis, gastric ulcer, duodenal ulcer, and heart diseases. Along with the efficacy of the 15 grape seed oil, it can provide a healthy food for elderly people.

In the above-described examples, the content of each additive can vary under the condition that the edible composition is within 10% of the whole raw egg (in volume). 20 For example, although the ninth example includes lavender 2 volume%, grape seed oil 1 volume%, salt 1 volume%, and sugar 1 volume%, it may comprise lavender 1 volume%, grape seed oil 1--5 volume%, salt 0--7 volume%, and sugar 0--5 volume%.

25 In addition, besides the additives as described above, meats, marine products, vegetables, various seasonings, spices, or the like can be containedincluded.

Along with the natural materials, processed materials such as vitamin or the like can be added. The raw egg with the edible composition injected thereinto exhibits the inherent flavor and aroma, and color of the additives. The color, 5 flavor, and aroma thereof can be freely adjusted and selected by edible pigments and spices.

On the other hand, the raw eggs processed according to the features of the invention can be provided to each individual user in various forms. For example, it may be 10 provided in the form of raw egg with an edible composition agitated therewith, or a solidified form heated or chemically solidified after agitating. Also, after removing the egg-shell from a solidified egg, it may be contained in a packing container made of vinyl or plastic material 15 before served.

The raw eggs processed according to the invention are rather necessary in the modern society. That is, what is called "hidden starvation" is known in the modern world of the science of nutrition. This "hidden starvation" is 20 resulted from inadequate intake of healthy nutrients such as vitamin, minerals, or protein. In many cases, people are not aware that he or she suffers from this starvation because they have quantitatively adequate meals. Occasionally, this starvation occurs to people who are 25 confident that they are taking qualitatively good meals. Therefore, this kind of starvation is more dangerous and more likely to be harmful to health. Currently, the

academic world reports that this starvation is of significance in this country.

The present invention becomes one approach to easily solve this hidden starvation. It is because the raw egg according to the invention has an edible composition including various nutrients and can be easily takeneaten. In particular, the well-egg of the invention exhibits the white of an egg even when the egg- shell is removed, so that it can be intakeneaten without a—feeling—of reluctance. Also, it may be processed such that without the white of an egg, it has various colors, flavors, and aromas, so as to meet various preferences of people, including elderly people, patients, adults, children, and men and women. Consequently, the raw egg of the invention can be served as an excellent favorite food, a nourishing meal, or a healthy food.

Industrial Applicability

As described above, according to the present invention, an edible composition is injected into the inside of a raw egg and agitated adequately, so that the edible composition is distributed over the whole area, but not localized in a certain area inside the white of the egg. Therefore, its—commercializingthe commercialization value of the eggs can be increased. Also, the raw eggs can be served as a healthy food or nourishing meal.

While the present invention has been described with

reference to the particular illustrative embodiments, it is not to be restricted by the embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope and spirit of the present invention.

Abstract

Disclosed herein is a processed raw egg, and a method of, and apparatus for, manufacturing the same, in which various edible compositions are added and mixed to a raw egg so that it can be served as a healthy food. The method comprises: a-cleaning with water and sterilizing for-a raw egg; an egg-shell drilling processstep; an edible composition injection processstep; a raw egg agitation processstep; and a well-done processheating step. The-An apparatus for carrying out the above method is also disclosed.